THE DELAWARE AND HUDSON RAILROAD BULLETIN

"The D&H"

OCTOBER 1, 1936

SHERMAN'S POND
WARRENSBURG, N.Y.

My Daily Wish

MY daily wish is that we may
See good in those who pass our way:
Find in each a worthy trait
That we should gladly cultivate;
See in each one passing by
The better things that beautify—
A softly spoken word of cheer,
A kindly face, a smile sincere.

I pray each day that we may view
The things that warm one's heart anew:
The kindly deeds that can't be bought—
That only from the good are wrought,
A burden lightened here and there,
A brother lifted from despair,
The aged ones freed from distress;
The lame, the sick, brought happiness.

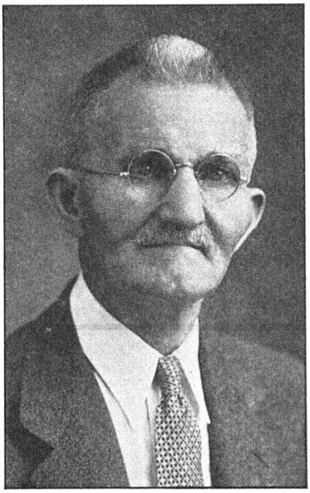
Grant that before each sun has set
We'll witness deeds we can't forget:
A soothing hand to one in pain,
A sacrifice for love—not gain;
A word to ease the troubled mind
Of one whom fate has dealt unkind.
So, friend, my wish is that we may
See good in all who pass our way.

—PHIL PERKINS.

The
DELAWARE AND HUDSON RAILROAD
CORPORATION
BULLETIN

Learned Trade in Germany

Retired Troy Cabinetmaker Recalls Interesting Incidents in Fatherland



JOHN HOFFMAN

POLICE officials kept the service records of German journeymen mechanics in the late seventies and early eighties when JOHN HOFFMAN, retired General Office Building carpenter and cabinetmaker, was practicing his trade in the Fatherland. A youth's mechanical training was not considered complete until he had spent several years working in cities other than his birthplace or where he had learned his trade. When he completed his apprenticeship, he became a member of the Young Men's Mechanical Society, receiving a book which contained his police passport and identification card, the addresses of the society's headquarters in various communities, and space for entries by the police and his employers.

As soon as the young mechanic arrived in a strange community, he went to the society building to inquire for work. If employment was available and the reports of his instructor and former employers were favorable, he was hired. He then went immediately to police headquarters to report and deposit his book in which periodic entries were made by the employer and any infractions of the law were recorded. When he left that city or village his book was returned to serve as a passport and letter of reference until he found another job.

In the event of illness or injury, hospitalization was provided for from a fund to which the employer contributed ten cents a month for each of his employes, and the workmen paid five cents monthly. If the patient elected to go home for treatment, medical care was furnished and he received a cash allowance for his board.

Another interesting feature of Germany's industrial history, according to MR. HOFFMAN, is the Jena Optical Works, "the factory that nobody owns." This plant, in which some of the world's finest telescope and camera lenses are made, was willed to the community by the owner, who died many years ago, with the stipulation that the plant be kept in first class condition and that any profits that accrue be used for the education of German youth.

MR. HOFFMAN was born at Speyertorf, in Rhenish Bavaria, January 19, 1860, the son of a mason contractor. After completing a grade school education, at the age of 14, he was sent to his uncle in Speyer on the Rhine to learn the carpenter's and cabinetmaker's trade. During the three-year apprenticeship period he received his room and board in return for his services, although his father had to pay $50 for his instruction. When he was "out of his time," he set out to find work, carrying all his worldly possessions in a knapsack on his back.

In his travels MR. HOFFMAN learned a number of interesting things about German railroads. When Germany's first railroad was completed, in 1835, physicians predicted that people would be made dangerously ill if not mentally unbalanced by the sight of the landscape moving past the car windows at the terrific speed of 20 miles per hour. To avert such dire consequences, a high board fence was built along the six-mile line linking Nurnberg and Furth. When the British-built locomotive *Der Adler* (The Eagle) raced over the road the passengers were theoretically kept physically and mentally sound by looking at the board fence, or keeping their gaze within the car.

German railroad builders seemed to prefer straight level track to grades and curves, regardless of construction expense. In the 20-mile line between Neustadt, near his birthplace, and Kaiserslautern, there were 12 tunnels, the boring of which might easily have been avoided had gentle curves and grades been used instead.

Three other customs which have survived a century of German railroading are: the purchase price is printed on every ticket sold; flowers are planted around every station, as well as most other buildings; and there is a gaily decorated Christmas tree in every station during the winter holiday season.

In August of the year in which they attained the age of 20, all Bavarian boys had to report to the army medical examiners with the possibility of being drafted for military service if they passed the rigid physical and mental tests. Of the 40,000 who reported with MR. HOFFMAN, half were refused. One of the eight doctors making the preliminary examination noticed that MR. HOFFMAN had a "double-jointed" thumb, the result of an injury sustained during his apprenticeship. After a consultation the examiners decided that he might be fit for service in the light cavalry; however, the second medical board rejected him.

In 1885, after eight years as a traveling mechanic, MR. HOFFMAN opened a shop of his own in Deidesheim, another Bavarian village, where he plied his trade for five years. Meanwhile, acquaintances writing and returning from America told of the excellent opportunities there for ambitious mechanics and, in 1890, he and his bride of one year sailed for New York on the *S. S. Lahan*, completing the voyage in what was then remarkably quick time, eight days.

Four times in the next few years MR. HOFFMAN obtained work only to lose out when the firms failed in the depression of the early nineties. The first was in a street car building plant at Bath Beach, near New York, where he fitted car doors and windows. When this plant went bankrupt, he found work in a similar factory in Brooklyn which also failed shortly afterward. After still another firm hired him then closed its doors, he made application for employment at the New York office of the Gilbert Car Works, which employed 950 persons in its Green Island plant. He was hired and worked in Gilbert's coach shop until the company went to the wall, August 12, 1893.

After remaining idle for three months, he was hired by Master Car Builder Chris Koerner to work in the Delaware and Hudson's Green Island shops, building and repairing coaches, freight and baggage cars. In 1896 he was transferred to the Maintenance of Way Department, and during the following thirteen years he helped build and repair water tanks, stations, freight houses and other buildings over the entire territory from Schenectady to Rouses Point.

For several years prior to 1909, MR. HOFFMAN was frequently sent to the general office building on North Pearl Street, Albany, to assist the building carpenter, Julius Reese. When Mr. Reese died in that year, MR. HOFFMAN was appointed to fill the vacancy. In 1916, when the new general office building at the Plaza was occupied, he was made building carpenter, the position he held until his retirement on pension, May 1, 1935.

MR. and Mrs. HOFFMAN, who have been married for 47 years, have three children: John L., of Baltimore, Md.; Mrs. Fred McKeon, of Troy; and Miss Gertrude Hoffman, who lives with her parents in their home at 395 Second Street, Troy. They are members of the St. Lawrence Catholic Church, of Troy.

Buck Up

PROBABLY the easiest thing in the world for most of us is to become discouraged. It is inevitable that at one time or another we feel that our efforts are being wasted, and that it isn't much use to try any longer.

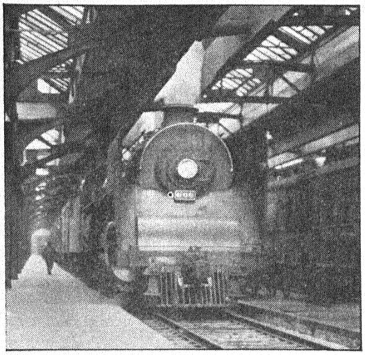
Did you know that when Abraham Lincoln was forty-four years of age he wrote a letter to a friend declaring that his career seemed doomed to end in disappointment, and expressing discouragement in the strongest possible terms? Not all of us, of course, can rise from our discouragement to do what Lincoln did. But it is worth remembering. It ought to help spur us on to new endeavor when we think we are out of luck.—*J. E. Dinger.*

Power Plant on Wheels

By A. I. LIPETZ

Chief Consulting Engineer, American Locomotive Company

(Continued from last issue)



The Laurentian at Windsor Station

THE main reason for the low efficiency of the steam locomotive is the steam cycle with a limited initial (cylinder admission) steam pressure and exhaust into the atmosphere. In order to raise the efficiency, it is necessary either to increase the admission pressure, which means to raise the boiler pressure, or to lower exhaust pressure, i. e. to exhaust the steam into a vacuum condenser. Both ways were tried, and they resulted in locomotives with high pressure boilers and locomotives with vacuum condensers.

Muhlfeld Locomotives

The first real high pressure locomotive boiler in this country, and about the first in the world, was the one built in 1924 by the American Locomotive Company for the Delaware & Hudson Railroad according to the design of J. E. Muhlfeld, Consulting Engineer for the Railroad. This boiler is also a combination of a water-tube fire box and a cylindrical shell with several drums, carries a pressure of 350 lbs. per sq. in., and is installed in the "Horatio Allen," a 2-8-0 locomotive with a cross-compound, two-cylinder engine. Special tests with the locomotive, which is not equipped with a feed-water heater, showed an overall efficiency of 8.02 per cent.

A few years later a second locomotive of the same type, the "John B. Jervis" carrying a pressure of 400 lbs. per sq. in., and shortly afterwards, the "James Archbald" with a still higher pressure, namely, 500 lbs. per sq. in., were placed in service on the same road. Three years ago a fourth locomotive of the 4-8-0 type, the "L. F. Loree," with approximately the same boiler, and the same pressure (500 lbs.) and with a four-cylinder triple-expansion engine, was built for the Delaware and Hudson and is now in operation. This engine is the first triple-expansion locomotive in this country and, I think, the second in the world. The locomotive had a special rotary-step-cam gear with Dabeg-Lentz poppet valves.

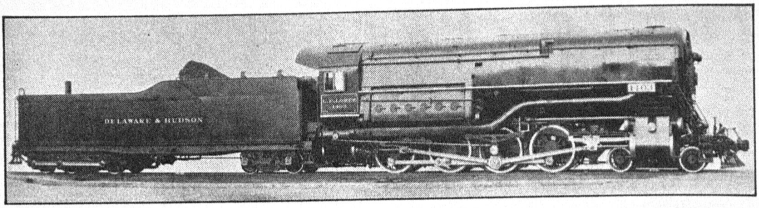
In 1926 the Baldwin Locomotive Works built an experimental 4-10-2 locomotive, No. 60,000, with a boiler very similar to the Brotan type, carrying 350 lbs. pressure. The locomotive had a three-cylinder compound engine. It was tested very exhaustively at the Altoona testing plant. The results of the tests showed a very steady steam consumption per indicated h. p. hr., varying very little with the load. The overall efficiency of the locomotive, including feed-water heater, fluctuated between 5.6 and 7.8 per cent. The locomotive was recently donated to the Franklin Institute of Philadelphia for permanent exhibition.

The Gresley High-Pressure Locomotive

As it was stated, the above-mentioned boilers (Brotan, McClellon, Emerson, Muhlfeld) represent a combination of water-tube fire box and a fire-tube cylindrical shell of the conventional locomotive. In 1929 a four-cylinder compound locomotive was built in England, by and for the London-North Eastern Railway, to the design of N. Gresley, Chief Mechanical Engineer of the Railway. It has a 100 per cent water-tube boiler of the marine type, carrying a pressure of 450 pounds per sq. in. The locomotive has been in service for more than five years, and while the description and some data have been published, service results are nevertheless lacking.

Schmidt High-Pressure Locomotives

At the time when J. E. Muhlfeld was developing his high-pressure water-tube fire box, the German



America's first triple-expansion locomotive

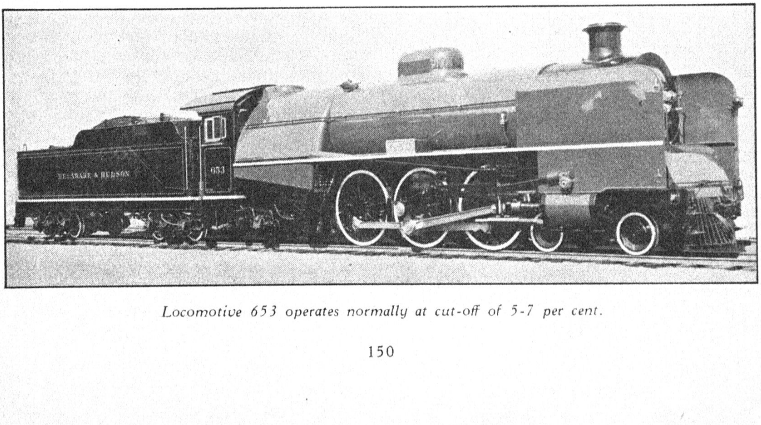
Schmidt Superheater Company was conducting tests with pressures of 835 lbs. per sq. in. in application to multi-cylinder compound reciprocating engines with different combinations of interstage heating.

As a result of the tests, a new type of high-pressure boiler for locomotives was developed and built for a 4-6-0 high-pressure locomotive of the German State Railways. There are two fundamental principles embodied in the boiler; first, the principle of two working pressures, a high and a low pressure, and, second, the principle of indirect evaporation, which eliminates the formation of scale.

The locomotive was completed in 1925 and since then was in intermittent experimental and regular service until some three years ago. Very elaborate tests made in Germany in 1927-1928 showed a minimum coal consumption per drawbar horsepower hour of 2.20 lbs., this corresponding to 8.9 per cent overall efficiency. Four more locomotives of this type, with modifications to suit the size of the engines and local conditions, were built in Europe and America. Only one of the five locomotives, the Canadian Pacific No. 8000, which is the only oil-burning locomotive of the group (the other four being coal-burners), has had less trouble than the others. However, no conclusive data have been received so far from this locomotive.

Loeffler Locomotive

Another noteworthy high-pressure development is the Loeffler locomotive built in 1930 by the Schwartzkopff Locomotive Works of Berlin for the German State Railways. This locomotive makes use of a few principles; first, the generation of high-pressure steam of 1700 lbs. per sq. in. is obtained by pumping steam from a high-pressure drum through fire box tubes, where it is superheated, into water in the original drum, where the water is evaporated; and so on in a continuous circle; second, the 1700 lb. pressure, after it has worked in the two outside high-pressure cylinders of a three-cylinder compound engine, is condensed in a heat exchanger, where the rejected heat evaporates steam of a pressure of about 250 lbs. This steam works in one middle low-pressure cylinder of the compound engine. The condensate returns to the high-pressure drum; thus the high-pressure system (drum, fire box tubes, pumps) is always filled



Locomotive 653 operates normally at cut-off of 5-7 per cent.

with the same substance in a continuous circuit and can, therefore, be kept free from scale. The locomotive is equipped with an economizer, feed water heater, high and low-pressure superheaters, an air preheater, and notwithstanding the multitude of appliances, including the two steam circulating pumps, is very compact and does not look cumbersome.

The locomotive was in experimental service for about two years. The economy in fuel was fairly high, about 30 per cent, corresponding to an overall efficiency of 12.6 per cent; nevertheless, it was never placed in regular service.

Swiss High-Pressure Locomotive

Another attempt was made by the Swiss Locomotive Works, which built a 1000 hp. locomotive carrying one pressure of 853 lbs. per sq. in. The engine was a nicely designed independent unit consisting of three uniflow cylinders working on a crankshaft, geared to a jack-shaft connected to the driving wheels. The locomotive was tested in Switzerland, Austria and France, and has not proved to be a success.

Recent Reichsbahn Moderate Pressure Experiments

After all these high-pressure attempts, the German State Railways reverted to the conventional stayed fire box boiler, but raised the pressure to 25 atm. (356 lbs. per sq. in.) and to 20 atm. (285 lbs. per sq. in.) in eight experimental locomotives, where different alloy steels were used in the boiler, and different combinations of cylinders in the steam engines These engines seem to be giving satisfaction, especially those of the lower pressure—285 lbs. per sq. in.

Condensing Locomotives

Having finished the review of the high-pressure development, we shall consider now the attempts made along the second way of increasing the efficiency of the engine cycle, namely, by the steam into a vacuum condenser. The application of a condenser to a reciprocating engine is impracticable in view of the large size of the low-pressure cylinder and, therefore, the use of steam turbines became imperative.

Turbine Locomotive

Shortly after the end of the war three groups in Europe were busy on solving this problem and they did it in three different ways; the North British Locomotive Company of Glasgow, Scotland, (Sir Hugh Reid and Ramsay), Dr. H. Zoelly, known for his successful steam turbines, and Ljungstrom Brothers. Frederick and Birger Ljungstrom of Stockholm, Sweden, have been working since 1917 quite independently of Ramsay and Zoelly and along different lines. They developed an air-cooled condenser of a special design and built in 1921 an 1800 hp. locomotive, without any previous experience in locomotive construction. All auxiliaries and their parts were tested separately in the laboratory, and later, when the locomotive was completed, it was tested on rollers with dynamometer brakes on an improvised locomotive testing plant. Thus the proper performance of the locomotive, as a whole, and separately of its details and auxiliaries, was tried beforehand and every part was thus perfected. After four months' tests the loco-

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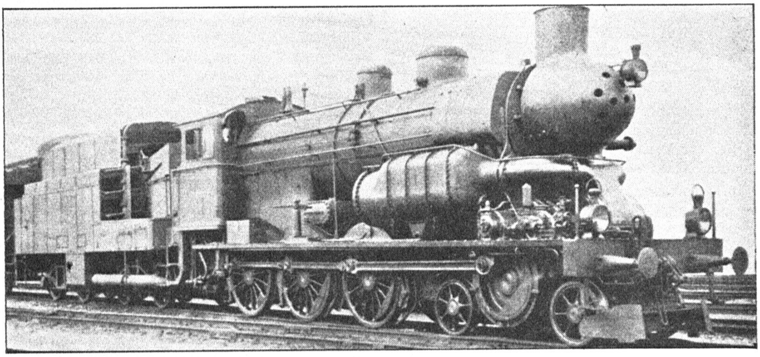
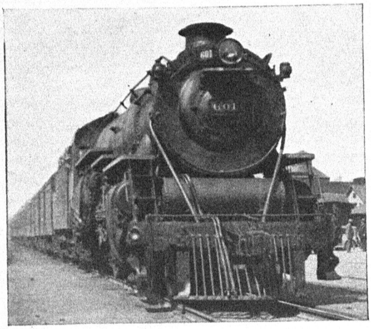


Early design of Zoelly Turbo-locomotive

How High Taxes H

Regardless of What Anyone Says, the Mas



Train 309 at Oneonta

BECAUSE the average industrial, commercial, or agricultural employe pays little or nothing in direct taxes, it is too often assumed that he is not a substantial contributor to the cost of government. If workers in general realized how far this assumption is from the truth, they would be less complacent in the face of the rising tide of taxation and public debt.

It is not mainly as a direct taxpayer that the worker is affected by the cost of government, but as an employe and a consumer. As an employe, he is affected by every influence acting on the security of his job and the rate of his pay. Consequently, he is vitally concerned with the ability of his employer to remain in business and to maintain or expand operations. More particularly is he subject to any influence tending to make employment and wages in themselves the bases of additional financial burdens to the employer. Tax burdens on business have already risen to a point where some employers are obliged to give serious thought to possible means of retrenchment. Since payrolls represent a substantial proportion of the total cost of doing business, they naturally are subject to close scrutiny under such conditions. The Social Security Act, with its prospect of large tax payments levied directly on payrolls, has made the situation even more serious in this respect.

In this connection, it is interesting to examine the relative magnitude of taxes and payrolls in different branches of business. Although information of this nature is rather difficult to secure, where obtainable it yields significant results. For example, Class I railroads of the United States in 1934 (the latest year for which statistics are available) paid taxes, exclusive of special assessments, amounting to 16.6 per cent, or almost exactly one-sixth, of their aggregate payrolls. For every annual wage or salary payment to an employe, they paid the equivalent of two months' wages or salary to Federal, State, and local governments. This comparison, of course, takes no account of the Social Security and Railroad Retirement acts. Under the former, a charge of 1 per cent of payrolls is imposed for the current year, increasing gradually to 3 per cent. Under the latter, there is imposed a tax of 3½ per cent on wages not in excess of $300 a month, effective on March 1, 1936. One of the largest railroad systems in the country estimates that taxes this year, including social security taxes, will amount to 21.9 per cent of the 1935 payroll and that this ratio will have increased to 23.9 per cent by 1938. Another large railroad company estimates the ratio, with social security taxes at their maximum, at 14 per cent.

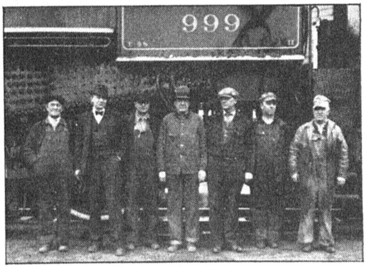
Binghamton Yard Crew

Other branches of business show varying but, on the whole, not dissimilar results. Twenty-six steel companies representing about 86 per cent of the entire industry paid taxes in 1934 equal to 11.5 per cent of their total payrolls; and the estimated average ratio of the same companies for the last six years, based on a rough estimate of payroll totals, is 10.7 per cent. These figures are, of course, exclusive of social security taxes, which will eventually amount to an annual charge of nearly 6 per cent of the payrolls. One large steel company reports that its ratio at present is approximately 9 per cent. One of the leading automobile manufacturing companies states that its tax payments in 1935 were equal to 21 per cent of its payroll.

s Hurt Railroaders

the Masses Foot the Government's Bills

To what extent the workers will actually bear the burden of the social security taxes is a matter of doubt. One-half of the tax for retirement benefits will be deducted from wages by the employer. This share, amounting ultimately to 3 per cent of wages and salaries up to $3,000 a year for each employe, will unquestionably be borne mainly by the latter. But an equal share will be paid by the employer, who must also pay the entire unemployment insurance tax to 3 per cent of the total payroll.



Way Freight on "the Chateaugay"

From the employer's point of view, these payments will represent costs of production; and they might reasonably be expected to be either passed back to the employe or on to the consumer, if it could be assumed that the employer had the power to shift them in this way. Under the assumption of perfect competition, the taxes could be shifted only to the extent that they drove marginal employers out of business, decreasing the supply of goods and the demand for labor, and thus raising prices and reducing wages. In actual practice, however, the adjustment between costs and prices is often brought about more directly. It is likely that at least a part of the social security taxes paid by employers will ultimately be borne by workers, either in the form of lower wage levels or higher costs of living, or both.

Probably the greatest part of the financial burden that falls on the worker as a result of the cost of government is one that he does not ordinarily recognize as connected in any way with public affairs. A very large proportion of all taxes levied in this country by Federal, State, and local governments consists of indirect taxes collected from the producer or distributor in the expectation that the latter will pass on the charge to the ultimate consumer; and it is essential to bear in mind that by far the largest group of consumers consists of workers and their families. It has usually been considered that one of the principal advantages of this type of tax lies in the fact that it is concealed in the price of the product and consequently that the ultimate payer of the tax pays it without realizing that he is doing so. While this is undoubtedly an advantage from the fiscal point of view, the realization is growing that it may be a serious weakness from the broader economic standpoint; for it is only a tax burden that is recognized as such that constitutes a standing argument for governmental economy.

It is impossible to measure the total burden of indirect taxation, partly because the detailed tax figures are not available and partly because many taxes, such as general property taxes, miscellaneous licenses, fees, etc., lie on the border line between direct and indirect, and their final incidence is uncertain. Even a cursory examination of the situation, however, is enough to show that the total is enormous. It has been estimated that the Federal Government derived more than 61 per cent of its tax revenue in 1935 from indirect taxes, and the proportion of indirect taxation in State and local finance is probably even larger. The "miscellaneous internal revenue" that now constitutes the largest item in Treasury receipts consists mainly of excise taxes that are passed on to the consumer, and the same is true of customs duties.

The general property tax that still forms the mainstay of State and local governments falls large-

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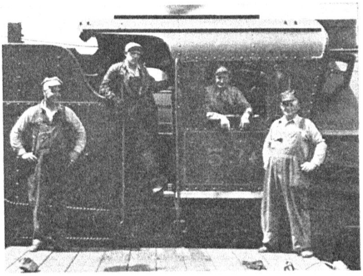

Susquehanna Division "Milk" Crew

The
Delaware and Hudson Railroad
CORPORATION
BULLETIN

Office of Publication:
DELAWARE AND HUDSON BUILDING,
ALBANY, N. Y.

PUBLISHED MONTHLY by The Delaware and Hudson Railroad Corporation, for the information of the men who operate the railroad, in the belief that mutual understanding of the problems we all have to meet will help us to solve them for our mutual welfare.

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Vol. 16 October 1, 1936 No. 10

CONSIDER that the average ton of freight is made up of articles from coal to strawberries, from sand to silk, and from basketfuls to trainloads, and I ask anyone whether, in sunshine or storm, beneath the blazing sun of summer, or in the sleet and storm of winter, he will undertake the job of delivering, day in and day out, regularly and unfailingly, a ton of this average and miscellaneous freight one mile for less than one cent.

—J. B. HILL.

Educated—and How!

IT has taken the truck operators many years to educate the public that highways were built primarily for commercial use," declares one Carl Marinello, general manager of a highway freight company in Chicago in arguing against the coordination of rail and highway traffic. He further states, or mis-states, that 39 per cent of the communities of the United States are entirely dependent on truck transportation.

We remember hearing about some of these last winter when storms blocked the roads, truckers waited for the taxpayers to dig them out, and only heroic efforts on the part of railroad employes saved several hundred persons from death by cold and starvation, but it is only truthful to say that the facts are exaggerated by Mr. Marinello. Automotive Facts and Figures, 1936, says only 6 per cent (approximately) of the country's population is located in communities not served directly by railroads.

The main point is that the truck owners believe what their drivers have long indicated by their actions on the road: that they literally own the public highways. The United States Supreme Court has decided quite the contrary; that "The highways of a state are public property, *the primary and preferred use of which is for private purposes;* their use for purposes of gain may be prohibited by the legislature as it sees fit."

The motoring public is pretty good natured and easy-going about such things but it is time it woke to a realization that the public highways will soon be appropriated by this organized minority unless steps are taken promptly to show them that they have fewer rights on the highways than private car owners who are, after all, footing the bill. If highway trucks of the heavy commercial type paid registration fees in proportion to the cost of maintaining the expensive highways which they alone necessitate, much heavy hauling would be eliminated. Safety on the highways would be increased immeasurably, not to mention the pleasure of motoring.

Can You Answer?

RECENT developments in the railroad industry have aroused public interest anew and the carriers are enjoying a popularity greater than at any time during the present century. The shipping and traveling public has been thrilled by the improved performance of the railroads in providing quicker and cheaper service, both passenger and freight, than the world has ever known.

Speed, comfort and safety, such as are provided by no other form of transportation, are the stock in trade of the railroads with which the public has become more or less familiar, though the well-informed employe still has many opportunities to give useful information on these subjects. Points of scenic, historical, or scientific interest along the line are also of interest to the traveler. Some trainmen regularly point out such places as they are passed en route.

Dearest to the hearts of the great majority of travelers is the steam locomotive which hauls the train. Naturally, for upon it, in their estimation, depends the speed and smoothness with which their journey is completed. (With hot boxes on cars practically eliminated, the traveler thinks but little of the vehicle in which he rides, *provided* it is properly heated and ventilated, has comfortable seats, windows that do not rattle, is clean, quiet and well-lighted, and one or two dozen other requirements.)

Public interest in locomotives is not confined to male passengers alone. A lady recently walked ahead from one of the Pullmans as one of our international trains was undergoing inspection at Rouses Point and made several very intelligent observations concerning the size and power of the locomotive, asking questions about it which showed considerable knowledge of the subject.

All of which leads up to the fact that employes must be informed, not only about the routine of their daily work but also the railroad as a whole. The public is becoming informed as a result of the efforts of the Association of American Railroads and because of the publicity that has been given to recent developments in the industry. Employes cannot "bluff" successfully. They must know the answers.

One of the best ways to become informed about matters concerning the Delaware and Hudson is to read the account of the Agents' Meeting on page 152 of this issue. It contains more general information than any single article published in the course of the year.

The railroads now have the best chance they ever will have to "sell themselves" to the public. Our future may depend on the success or failure of their efforts. We have an apportunity. Let us make the most of it.

They Missed Out

FROM the pages of *The Seven Seas*, a publication of the Hamburg-American steamship line, comes the story of the three Americans in Bremen who had spent the evening at that city's hospitable Rathskeller and arrived at the station too late to catch the train for Berlin.

"What time's another train?" asked the most sober of the three.

"Not for two hours," replied the ticket attendant.

"Fine!" exclaimed the man, and the three retraced their steps to the place of amusement. Just as the next train for Berlin was about to leave, the three appeared at the gate. Two of them dashed wildly down the platform and jumped on before the conductor closed the doors. The third wandered disconsolately over to the attendant and said, "When's the next train?"

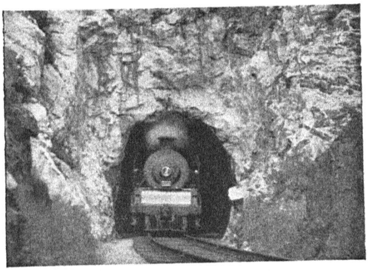
"Not until morning, now. You might have hurried with your friends and caught that one," suggested the attendant.

"Hurried, did they?" said the man, sneeringly, "a lot of good it'll do them. They came down to see me off."

How Taxes Hurt

(Continued from page 153)

ly on real estate. While the landowner undoubtedly pays a part of the tax, there can be no doubt that a levy on buildings is comparable in its nature to a tax on any other commodity and is shifted to the consumer, although the process of shifting may be less swift and direct than in the case of a commodity for immediate consumption. A tax on dwelling houses, for example, must be paid largely by those who occupy the houses, while taxes on factories, warehouses, offices, and stores represent elements in the cost of producing and distributing commodities and services and must be paid by consumers.

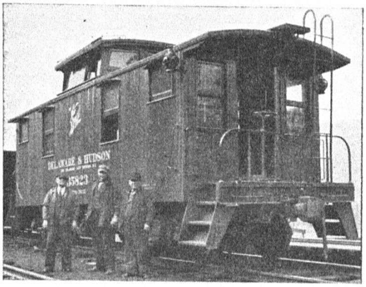


THE LAURENTIAN, *Willsboro Tunnel*

The concern of industrial employes in the cost of government is closely related to their interest in the trend of business profits. It has been pointed out repeatedly that no system of taxes on business can yield adequate revenue unless business is permitted to earn profits out of which taxes can be paid. This is merely another way of saying that, to the extent that profits diminish, the cost of government must be paid out of the other distributable shares,—rent, interest, and wages,—of which wages are the largest. As was pointed out in a recent issue of *The Guaranty Survey*, taxes paid by all corporations in the United States in recent years have more than wiped out their aggregate net earnings.

The economic welfare of the employe depends primarily on the earning position of the business that employs him and on its ability to return a high rate of real wages—that is, of wages expressed in terms of food, clothing, shelter, and the other elements in the cost of living. Even if excessive costs of government do not reduce the level of money wages, their effects on the employe's standard of living are exactly the same when they raise the prices of the commodities and services that he must buy. Students of the subject realize that the low standards of living in some countries result partly from the costs of government and are endeavoring to determine whether the rising costs in the United States constitute a threat to the relatively high standard of living that has prevailed in this country in the past.

If the workers of the United States, who constitute the great mass of the consuming public, as well as of the voting public, could be made fully aware of their true interest in governmental economy, a great force would be set in motion to correct the tendency toward fiscal irresponsibility that has developed in recent years. After all that has been and can be done to increase the relative share of the total burden borne by the well-to-do, it is the great mass of the people who, in the nature of things, must continue to pay the bill. The burden is too great to be borne by a few, whatever their financial position may be. If every commodity purchased and every bill received by a worker could bear upon its face a note stating the amount of the total charge representing taxes paid at one point or another in the process of production and distribution, public opinion would quickly force a reversal of present fiscal tendencies.—*The Guaranty Survey.*



On Oneonta-Wilkes-Barre Run

Point of View

An Irishman who worked for the city came home one evening after a very hot summer's day and began to "kick" at his wife for not having his supper ready on time.

"What do yez mane by talkin' to me that way?" she said to him. "Here I am, slavin' me health an' strength away over the washtub on a hot day like this, and you down in your nice, cool sewer." —*Termaco Times.*

Under Guard

IN January 1905, the manager of the Premier Diamond Mine in South Africa, while strolling through the pit during the noon hour, saw the sparkle of what he at first thought to be a broken bottle. Prying it loose with his stick from the rubble in which it was embedded, he found it to be a diamond as large as a medium-sized grapefruit. This remarkable stone, the largest ever found, has since become known to the world as the Great Cullinan. Upon being cut, it proved to be a pure white stone, four by two and one-half by two inches, weighing 3025 carats, or 1.37 pounds. The Great Cullinan was immediately purchased and presented to King Edward.

The question then arose of how a gem of such enormous value could be transported to England in safety. After many discussions and a great amount of newspaper publicity, four men, armed to the teeth, left the Premier Mine, carrying with them a leather dispatch case. Crossing the 30 miles of open veldt to Pretoria under heavy escort, they boarded a special car attached to the mail train to Cape Town. In the liner by which they took passage to England a safe had been specially installed and in it was placed the dispatch case, two of the men remaining on duty beside the safe night and day. From Southhampton a special train took them up to London and a strong guard of police and detectives escorted them to the bank at which the diamond was to be delivered. When the dispatch box was opened in the presence of a group of expectant officials it was found to contain nothing more valuable than a lump of coal! The stone itself had been wrapped in cotton wool and tissue paper, put in a cardboard box, and sent to England by parcels post, not even the postmaster-general being given an inkling that it was in the mails—E. A. Powell, *Yonder Lies Adventure.*

50-50

A football player in a small college was extraordinarily dumb, but to the surprise of everyone he passed all of his work including a special examination in chemistry. The chemistry professor was asked about it, and he said "I decided I would let him pass if he answered 50 per cent of the questions correctly.

"I asked him two questions—one he answered wrong—one right. Therefore I let him pass. The first was 'What color is blue vitriol?' He answered 'Pink.' That time he was wrong. The other was 'How do you make sulphuric acid?' He answered that *he didn't know.* That time he was right."

Power Plant on Wheels

(*Continued from page 151*)

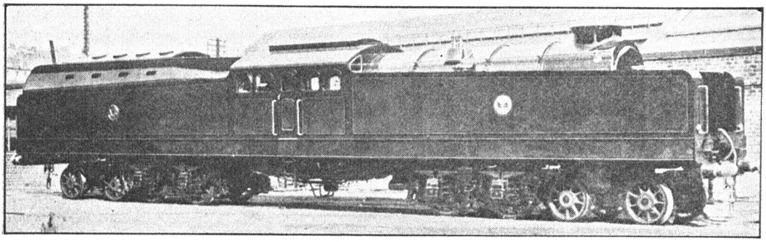
motive was turned over to the Swedish State Railways, where it went at once into service without a hitch. The locomotive pulled regular trains with speeds as anticipated, the starting was smooth, the vacuum was good (between 24 and 27" of mercury column), and the average fuel consumption was about 2 lbs. of coal per drawbar hp. hr., which was considerably higher than it should have been. Nevertheless, for Swedish railroad conditions it represented some saving in fuel as compared with reciprocating locomotives, if referred to a ton-mile basis. The variation in speed of the turbine accounted partly for the high consumption of fuel per horsepower hour.

The main disadvantage of the locomotive was, of course, the complication, the high first cost, the multiplicity of parts, with the likelihood that some of them might get out of order once in a while, and the relatively low saving in fuel. Another turbine locomotive, slightly larger in power, was built for the Swedish Railways; this seemed to have done better than the first as to fuel. In 1923 a 1500 hp. turbine locomotive was built for the Argentine State Railways. The Ljungstrom Company guaranteed a saving in fuel of at least 50 per cent in cold weather and 40 per cent in hot weather, as compared with ordinary locomotives doing similar work. The guarantee was fulfilled, but the locomotive required so much maintenance and such lengthy repairs that as a whole it was not a success, and the expected order for duplicates never materialized.

The last Ljungstrom condensing turbine locomotive was built in 1926 by Beyer, Peacock & Co., Manchester, England. It was a 2000 hp. locomotive; it had been tested for a long time on the London, Midland & Scottish Railway; it gave seemingly good results, but was never turned over to a railway for actual operation. There were rumors sometime ago that a railroad passing through a waterless country was acquiring this locomotive for its use, but these expectations did not materialize.

(Quite recently the Union Pacific Railroad placed an order with the General Electric Company, for delivery early in 1937, of the first turbine locomotive in this country, which, according to preliminary specifications, will have an atmospheric cooler for recovering water from steam and directing it back into the boiler, and electric transmission to the wheels from a generator driven by 1,500 pound pressure steam.—EDITOR.*)*

There are several reasons for the failure of the condensing turbine locomotive. The first reason is a fundamental one, namely, the turbine is inherently unsuited to work at variable speeds, and if directly coupled to the locomotive wheels, which run at different speeds, it can not be economical. The efficiency curve of a turbine has a parabolic shape with zero value at zero speed, maximum value at the optimum speed, and again zero value at some higher speed, approximately double the optimum speed. Ljungstrom and Zoelly, of course realized that; Ljungstrom even shaped his blades so as to flatten the efficiency curve as much as possible, but neither of them evidently did realize the extent to which the speed on a railroad varies. Sometimes, switching work in a station with a few cars by a turbine locomotive would wipe out all the economy it might have given during the trip. Frequent stops and starts would act likewise. Ljungstrom investigated in his laboratory every detail of his turbine locomotive, but he may not



North British Reid-MacLeod Geared Turbine Locomotive have investigated the railway operation characteristics, which are not less important. His research work was the most elaborate ever done in railroad engineering, but still it was incomplete. He overlooked the fact that the reciprocating engine of the conventional locomotive is better adapted to speed variation than the turbine, and that in this adaptability lies one of the secrets of its success.

The second reason is also a fundamental one, although not as grave as the first, namely, the fact that the turbine is not reversible. This is another disadvantage of the turbine as compared with reciprocating engine. For reversing, an idle pinion must be inserted in the gear between the turbine and the jack shaft or the first driving axle. This method has been worked out very nicely by Ljungstrom, and seems to have given satisfaction, as no serious complaints have been made. It is, of course, a complication which adds weight, costs money, etc. Another method of reversing consists of a special reversing turbine which is inserted when necessary by means of a clutch; or a third method, the one used on all German turbine locomotives, is possible: the reversing turbine is set rigidly on the shaft of the forward turbine and runs with it all the time, but in vacuum when the forward turbine runs under steam, and vice versa. This scheme is less efficient, as some power is absorbed by running of the reversing turbine all the time in a rather imperfect vacuum.

Thus, the more radical and revolutionary changes in the simple construction of the steam locomotive, in the direction of the latest improvements of the stationary plant, did not accomplish much, hardly anything. Only the more modest innovations can be introduced in locomotives, and then they have to be made gradually and must be sufficiently tried out. Feed water heaters which sometimes, at full load, save as much as 16 per cent of steam, and consequently water, save less at lower loads and, therefore, they are not universally used. The same is true for poppet valves, which proved their advantages in some cases and are liked on some roads abroad—this depending mainly upon the variation in load.

(Concluded next month)

The Beginning of the End

In a certain section of Pennsylvania which is populated chiefly by the so-called Pennsylvania Dutch who still speak imperfect English, a little boy stood with his mother beside the railroad track watching a long freight train pass. When the caboose went by the little fellow said to his mother: "When the little red house makes by, the train's all, ain't Mom!"

Test Your Brakes

HOW a single block of wood of exact dimensions may be used to test automobile brakes is described by J. S. Baker of the National Safety Council. The piece of wood does the job of an elaborate brake testing machine and can be carried in the car as a constant check on the brakes.

Based on simple arithmetic, the wood block brake tester is four inches high, three inches wide, and 1-25/32 inches thick. According to the Uniform Vehicle Code, brakes should stop a car going 20 miles an hour within 30 feet. Thus the brakes must be able to exert a stopping force equal to 44.6 per cent of the car's weight. So, the block to test this force must have its width just 44.6 per cent of its height. Brakes to do this are not very strong. If excellent brakes are wanted, they must produce a stopping force of 75 per cent or more of the car's weight and the width of the block must accordingly be 75 per cent of its height.

A single block may be used to test for two different stopping rates, good and excellent, simply by turning one of two faces forward. Such a block has a width 75 per cent of its height for length and a thickness 44.6 per cent of its height. When stood on end, flatwise forward, it will tip over for the legal stopping rate, and, when stood edgewise, it will take pretty good brakes to knock it over.

The block must be on a level spot on the floor of the car, it must be square with the actions of the car, and it must not slide. To prevent sliding, it should have a piece of medium sandpaper glued to the bottom.

The method of applying the test is very simple. The block is placed on the floor of the car. When a speed of 20 miles an hour in high gear has been attained, the driver applies the brakes. If the block tips over within the 30 feet at that speed when standing on end, flatwise forward, the brakes are within the legal stopping rate. If the block tips over when stood edgewise forward, the brakes may be said to be excellent.

Invited Guests

A CROWD of troubles passed him by, as he with courage waited. He said: "Where do you troubles fly, when you are thus belated?"

"We go," they said, "to those who mope, who look on life dejected, who weakly say good-bye to hope; we go where we're expected.—*Francis E. Allison.*

Clicks from the Rails

Longest Railroad Bridge

honors are now back in America with the opening, last December, of the $13,000,000-span across the Mississippi 1½ miles north of New Orleans, which provides two tracks for the Southern Pacific, replacing car ferries, two 18-foot concrete roadways, and two pedestrian sidewalks. This bridge, including approaches, is 4.4 miles long and extends 3,524 feet across the river at a height of 135 feet above high water level.

Salt Lures Deer to Death

in front of locomotives, according to United States foresters, who report: "Railroads universally use salt to keep track switches from freezing and deer like salt as a child does ice cream." To stop the killing of hundreds of deer each winter and spring, something they do not like, perhaps kerosene, will be mixed with the salt to drive them away from the tracks instead of leading them to their death.

A Children's Railroad

being built as a practical problem to teach railroading by pupils at North Georgia, Russia, will link two stations two miles apart, and will be operated exclusively by and for children. Engineers of the Trans-Caucasian Railway are supervising the project. At present the cars and most of the track laying are complete.

Telegraphy Was Tied Up

between Malone and Norwood on the Rutland for several hours by a dead snake. Linemen sent out to locate a short circuit in the telegraph train dispatching system found a two-foot garter snake lying across the wires. As the snake's head had been crushed it was deduced that someone had killed it and when it was thrown from the road it had accidentally landed across the wires.

Parked on the Tracks

of the Norfolk and Western where a narrow West Virginia dirt road parallels the right of way, was an auto with windows closed, doors locked, and brakes set. The engineer of an approaching train made an emergency stop and the crew tried to move the car. When their combined efforts failed the county constable was called and the owner located. The latter, a merchant, explained that he was collecting overdue accounts and, spying a debtor, had looked for a place to park. There was a stream on one side of the road and the tracks on the other so he parked on the railroad, not realizing that his carelessness might have caused a wreck with consequent loss of life and property amounting to many times he sought to collect.

A Railroad Coach

has been converted into a church by fifteen families at Frankfort, Ill. who never had a church and had been holding services in a private home. The 60-foot long coach-church, donated by the Rock Island and moved 13 miles to its new site on rollers, has been remodeled to accommodate 72 people.

In Each Hour of 1935

American railroads earned an average of $393,892; spent $295,832 in operating expenses; paid $287,582 in wages and $27,031 in taxes to national, state, and local governments; 3,598 cars were loaded with revenue freight; and 50,913 passengers boarded trains.

Two B. & O. Trains,

discontinued several years ago because of lack of patronage, have been restored to service between Washington, D. C., and Cincinnati, Ohio, due to increased passenger business since the fare was cut. Both trains are air-conditioned throughout.

Caterpillars Stalled Trains

and seriously delayed others so frequently on Canadian railroads this year that air blower pipes attached to leading locomotive driving wheels were replaced with pipes delivering steam at boiler pressure. This device proved so effective that practically all freight locomotives were so equipped.

Railroader-Governors

are Edwin C. Johnson, of Colorado, and Leslie A. Miller, of Wyoming, who were fellow-brakemen on railroad trains crossing Colorado twenty years ago. Each forsook railroading for politics and became chief executive of his state, a coincidence which was discovered when Governor Johnson dropped in on his old friend at the capitol in Cheyenne to talk over old times.

Railroad, Pennsylvania,

is the post office name for Shrewsburg, York County, in the Keystone State. Years ago the people of Shrewsburg had a habit of saying, "I'm going over to the railroad," or "Let's go over to the railroad," located 1¼ miles away. Later, when buildings were erected by the tracks, the villagers dubbed it "Railroad" and the name still sticks.

A Nap

nearly cost a Rouen (France) dock worker his life. Ordinarily the 50-year old man slept on the quays, but, seeing a comfortable looking box car on a siding, he got in to go to sleep. Later he awoke to find the car closed, sealed, and in motion. At every stop he banged on the sides of the car, calling for help. None came and eventually he became too weak to call. Eleven days later the nearly-starved man was taken from the car at Besancon, 350 miles from home.

Read Up

IT is well to read up everything within reach about your business; this not only improves your knowledge, your usefulness and your fitness for more responsible work, but it invests your business with more interest, since you understand its functions, its basic principles, its place in the general scheme of things.

—DANIEL WILLARD.